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MARINE INDUSTRIES IN THE USSR[Numbers in parentheses refer to appended sources.]

The total world catch of fish and marine invertebrates in 1936 was around 182 million centners. About 170 million centners of the catch were fish, of which more than nine tenths were caught in marine waters and less than one tenth in fresh waters and lakes. (1)

According to statistics on commercial catches, England has 35, Germany 40, the US 125, and the Soviet Union 250 species of fish. More than one third of the Soviet catch is composed of commercially valuable fish such as salmon and large chastik.

To increase marine resources in the Soviet Union, large-scale work in artificial fish breeding and acclimatization is being carried on. Fish-breeding plants annually produce hundreds of million young salmon and other fish. Black Sea red mullet has been successfully acclimatized in the Caspian Sea where many thousand centners are caught annually. Nereis worms, very important in feeding sturgeon, were introduced into the Caspian and are now found in more than half the northern part of the sea. These measures are only the beginning of the work of increasing marine fauna.

The Caspian Sea is the world's largest producer of sturgeon and also leads in the production of large chastik. Its seal catch not long ago was as high as 100,000 head a year.

Aral Sea resources differ from Caspian and other sea resources in the USSR in that the Aral Sea contains only fish, the most important of which are bream, carp, and Caspian roach. Of secondary importance are sheatfish, barbel, and others, which together constitute only 10-15 percent of the total catch. (2)

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The Caspian-Aral region produced from 4 to 5.5 million centners of fish during the years 1936 - 1939. Of this catch, Caspian roach (*Rutilus rutilus caspius*) constituted 28 percent; bream (*Abramis brama*) about 18 percent; pike perch (*Lucioperca lucioperca*), Caspian shad (*Caspialosa caspia caspia*) and Volga herring (*Caspialosa kessleri volgensis*) about 8-9 percent each; carp (*Cyprinus carpio*) about 6 percent; herring (*Caspialosa brashnikovi brashnikovi*) 2 percent. The sturgeon catch (*Acipenser guldenstadti*, *Acipenser stellatus*, *Acipenser nudiiventris*, and *Huso huso*) was about 3.5 percent of the total catch. (1)

Azov Sea resources contain primarily anchovy (*khamsa*). The catch in the pre-war years amounted to as much as 800,000 centners per year. Other fish include sturgeon, red mullet, pike perch, herring (*Clupea maeotica*).

Although the Black Sea has long been considered poor in resources, scientific investigation during the past few years has shown that it does have considerable resources. In the upper layer of water there are huge numbers of anchovies (*khamsa*), mackerel, sprat, and horse mackerel. Young tuna are brought in periodically from the Mediterranean. The sea also contains dolphins, the catch of which prior to 1940 averaged about 100,000 centners a year, and an almost untouched supply of mollusks and seaweed. (2)

The Black - Azov Sea region produce about 3.2 million centners of fish annually. Anchovy (*Engraulis encrasicolus* ssp.), herring (*Clupeonella delicatula*), and pike perch (*Lucioperca lucioperca*) constitute 18-20 percent of the catch, bream (*Abramis brama*) over 9 percent, mackerel (*Scomber scombrus*), young tuna (*Sarda sarda*), and goby (*Neogobius*, *Mesogobius*, and other varieties) 3-4 percent. Sturgeon (*Acipenser stellatus*, *Acipenser guldenstadti*, *Acipenser sturio*, and *Huso huso*) are especially valuable in this region, and constitute about 3 percent of the entire catch. (1)

The Baltic Sea has less varied resources than the southern seas. Sprat (*salska*), the Baltic's most important commercial fish, makes up over half the catch. Other fish are cod, plaice, sprat (*kil'ka*), smelt, salmon, and eels.

The Barents, White, and Pechora seas contain primarily cod and herring. Other fish are bass, halibut, plaice, and salmon. These seas also contain marine animals, seaweed, and invertebrate animals. Of the three varieties of seals found in the North Atlantic, the Newfoundland, Jan Mayen, and the White Sea seals, the last are most common. Annual world catches of Greenland seals in the White Sea were as much as 500,000 - 600,000 head in some years.

Marine resources in the Arctic Ocean are of high quality but are not found in large quantities. Over 80 percent of the total Arctic fish catch is made up of whitefish. The Soviet Arctic contains more than half of the world's whitefish. White whales, seals and walrus are not numerous, and as yet are not being caught in sufficient numbers. (2)

In commercial productivity, i.e., the quantity of fish caught per square kilometer, the Azov Sea holds first place in the world, with an annual catch of 80 centners per square kilometer. The Sea of Japan, with a catch of 27-30 centners per square kilometer, is second, and the North Sea, with 25 centners per square kilometer, is third. The Yellow and East China seas together yield 14-16 centners per square kilometer annually, and the Okhotsk and Barents seas, 4-5 centners per square kilometer.

Of the inland water basins, the Caspian Sea, yielding 12 centners per square kilometer, has the highest productivity in the world. Lake Balkhash, with 8-10 centners is second; Lake Erie, with 7 centners, is third, and the Aral Sea, with 5-6 centners, is fourth.

The geographical distribution and industrial utilization of marine resources in the USSR is shown in the following table:

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<u>Seas</u>	<u>Resources (%)</u>			<u>Ratio of Fish and Animal Catch to Resources (%)</u>		
	<u>Fish</u>	<u>Marine Animals</u>	<u>Inverte- brates</u>	<u>Sea- weed</u>	<u>1910-1913</u>	<u>1936-1940</u>
Caspian	12.0	20.0	--	--	90-100	90-100
Black and Azov	8.4	20.0	30.0	30.0	20-25	50-60
Aral	1.6	--	--	--	80-90	90-95
Baltic	3.4	--	--	--	40-50	40-50
Barents	33.0	35.0	10.0	25.0	5-6	30-35
White and Pechora	1.6	5.0	--	--	50-60	60-70
Far Eastern waters	<u>40.0</u>	<u>20.0</u>	<u>60.0</u>	<u>45.0</u>	<u>10-15</u>	<u>30-35</u>
Total	100.0	100.0	100.0	100.0	30-40	45-50

Geographically, the USSR marine resources are fairly evenly distributed. Only the southeastern part of the country from the Aral Sea to the Pacific Ocean lacks any significant bodies of water.

Marine resources in the Barents, White, and Pechora seas (along with the northwest shore of Norway and the Bear Island-Spitsbergen region) are approximately three times larger than the Caspian Sea resources, four times larger than the resources of the Black and Azov seas, and almost ten times larger than the Baltic Sea resources (including only the Soviet Baltic region).

The following table shows changes in the geographical distribution of marine industries from pre-Revolutionary Russia to 1950 (in percent):

<u>Seas</u>	<u>1863</u>	<u>1893</u>	<u>1910</u>	<u>1929</u>	<u>1940</u>	<u>1950</u>
Caspian	70.0	69.3	61.0	57.3	27.5	15.8
Black	0.4	18.5	15.5	10.2	17.5	11.3
Azov	23.2					
Aral	--	--	4.0	2.2	3.2	2.1
Baltic	--	4.5	13.5	--	--	4.2
Barents, White, Pechora	6.4	2.7	3.0	5.5	18.8	23.2
Arctic	--	--		4.5	4.7	3.1
Far Eastern waters	--	5.0	13.5	20.3	28.3	40.3

The catch in open seas, including northern European USSR seas and the Pacific Ocean, increased from about 15 to 25 percent in 1929 to 47 percent in 1940. The northern European USSR catch has increased over six times since 1910. By the end of the postwar Five-Year Plan, marine resources of the northern European USSR seas and the Pacific Ocean are to produce 63.5 percent of the total catch of fish, seal, and other marine products. The catch in the

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southern seas (Caspian, Azov, and Aral) is planned to be the same as before the war, while that of the Black Sea is to increase. Marine habitats will be expanded. The total annual catch of fish, marine animals, and invertebrates is to be increased by 34-35 million centners.

The utilization of marine resources was and still is lower than it could be, especially in the Arctic and the Far East. Prior to the Revolution, 30-40 percent of the total resources were being utilized, with the productive resources of northern European USSR and Far Eastern waters being utilized only 5-10 percent, or, at most, 15 percent. Between 1918 and 1941 the ratio of utilization increased approximately  $1\frac{1}{2}$  times as a result of the development of industries in the Barents and Far Eastern waters. Today, only 50 percent of the fish and marine resources and about 10 percent of the seaweed are utilized. (2)

The following polar regions of the Atlantic and Pacific oceans constitute the main deep-sea-fishing grounds of the USSR.

The north-polar Pacific region stretches from Korea, Hokkaido, and the Kurile Islands in the west to Vancouver in the east and to Bering Strait in the north. This region produces 16 million centners of fish annually, of which Pacific herring (*Clupea pallasii*) comprises 38 percent of the catch, migrating or humpback salmon (*Oncorhynchus gorbusha*) 22.5 percent, dog salmon (*Oncorhynchus keta*) 17.5 percent, red salmon (*Oncorhynchus nerka*) 8.7 percent, Pacific Ocean cod (*Gadus morhua macrocephalus*) 8.7 percent, and plaice less than 5 percent. Kamchatka crab (*Paralithodes camtschatica*) is common among invertebrates.

The south polar Pacific region stretches from Korea and the Kyushu Islands to Hokkaido, including northern Korea and southern Primorskiy Krai, in the west and from California to Vancouver in the east. This region produces 45.6 million centners of fish annually of which Pacific sardines (*Sardinops sagax melanosticta*, *Sardinops sagax coerulea*) constitute 65 percent of the catch, mintay (*Theragra chalcogramma*) 5.7 percent, Japanese mackerel (*Pneumatophorus japonicus*) 4.2 percent, striped tuna (*Katsuwonus pelamis*) 3 percent, tuna (*Thynnus thynnus*, *Thynnus orientalis*) 2 percent, plaice (*Paralichthys*, *Limanda*, *Eopsetta*, *Parophrys*, and others) 2 percent, yellow tail (*Seriola quinqueradiata*) 1.1 percent, and Pacific horse mackerel (*Trachurus japonicus*) and anchovy (*Engraulis japonicus*) .6 to .7 percent. Among invertebrates, crabs (*Portunidae*) and marine mollusks (*Ommastrephes sloanei*) are most common.

The south polar West Atlantic region provides catches made up of 64 percent menhaden (*Brevortia tyrannus*), about 11 percent red mullet, (*Mugil cephalus*, *Mugil curema*, and other varieties) and various species of humpback carp (*Micropogon*, *Cynoscion*, *Leiostomus*, and others). Among invertebrates are crabs (*Callinectes sapidus*), shrimp (*Peneus*), and oysters.

The south polar East Atlantic region contains sardines (*Sardina pilchardus*) which compose 31 percent of the catch, hake (*Merluccius merluccius*) 7.7 percent, horse mackerel (*Trachurus trachurus*) 5.1 percent, tuna (*Thynnus thynnus*, *Thynnus germon*) about 4 percent, anchovies (*Engraulis encrasicolus*) about 4 percent, and mackerel (*Scomber scombrus*) and red mullet (*Mugil cephalus* and other varieties) 1.2 to 1.3 percent. Invertebrates found are lobsters and oysters.

The north polar Atlantic region stretches from Cape Cod to the English Channel to Greenland, Spitzbergen, and the Canary Islands. This area produces 47.8 million centners of fish annually, or over one fourth of the world catch. The catch is composed of Atlantic herring (*Clupea harengus*) 35 percent, Atlantic cod (*Gadus morhua*) 31.5 percent, haddock (*Melanogrammus aeglefinus*) 7.5 percent, northern cod (*Pollachius virens*) 4.2 percent, bass (*Sebastes marinus*) 2.5 percent, and plaice (*Platessa*) 1.7 percent. Invertebrates include lobsters (*Homarus*), shrimp (*Pandalus* and *Crangon*) and marine mussels (*Mytilus edulis*).

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The Arctic region, composed essentially of the Arctic ocean and adjacent seas (in the USSR, the White, southeastern part of the Barents, Kara, Laptev, East Siberian, and Chukchi seas) produced a catch of 300,000-500,000 centners in the period 1936-37. The catch included northern cod (*Boreogadus saida*), cod (*Eleginus navaga*), White Sea and Pechora herring (*Clupea pallasii maris-alba* and *Clupea pallasii suworowi*), trout (*Salvelinus alpinus* and others), whitefish (*Coregonus muksun* and others), goby (*Myoxocephalus quadricornis*), and northern plaice (*Lipsetta glacialis*).

Far Eastern waters in the USSR (Bering Sea, Okhotsk Sea and the Sea of Japan) contain a great abundance and diversity of marine resources. They have almost twice as many fish as all the southern seas together; 20 percent of all marine animals, excluding whales, which are found in the Soviet Union; 60 percent of the invertebrates; and 45 percent of the seaweed. The northern and Far East regions together contain about 75 percent of the total fish and other marine animals of the Soviet Union.

The two most important varieties of fish in these waters are herring, which are caught in the Sakhalin region in amounts of 5-6 million centners a year, and salmon. Other fish such as cod and plaice may also exist in large amounts. Whales, seals, mollusks of nearly all the known commercial species, crabs, and seaweed which grows along the shores of Primorskiy Kray, Kamchatka, and in other regions are also plentiful (1).

## SOURCES

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